0123

MR. WRENN: You guys have a viewgraph, per chance?

MODERATOR BROWN: I think they put it away. I'm sorry. It was here. I'm sorry, they disconnected it.

MR. WRENN: Hi, ladies and gentlemen. I won't take too much of your time. I've got some written comments, but for those of you who were at the Las Vegas meeting, you might remember me. I remember some of you. And I told people that I'd been a university professor dealing with radioactivity, radiation, and the biological effects of radiation most of my life. And one of the things I did was I was on a committee of the American Physical Society, which in the mid-1970s looked at the question of disposal of

0124

high-level radioactive waste, and we had about a third of a million dollars from the National Science Foundation. We flew in every expert in the world that dealt with radioactive wastes to talk to them.

We made some recommendations, which are published in the American Physical Society's Reviews of

552387

Modern Physics, a big fat journal. Unfortunately, I don't have a copy. There is one in the University of Nevada Las Vegas library in the basement, which you can get out. And I have the reference to it is in my written remarks.

But I was particularly interested in the question of the radioactive strontium and cesium 137, which are the most dangerous fission products in nuclear waste, and constitute the highest radioactivity inventory in the proposed repository. And our committee made a recommendation which was that any repository chosen should be sufficiently isolated geologically that the geological barriers would provide enough time between the time when radioactivity's starting to move from the repository to the nearest receptors, which would probably be here in the valley, and I looked at -- I read the DOE report with great interest, and I took one of our graphs from the American Physical Society report, and what we plotted

0125

was hazard index, the amount of water you had to dilute the waste with to get down to drinking water limits, a part 20 water limits. That's the Nuclear Regulatory

Commission's regulatory numbers.

And you can't see this, but what happens is, for the first thousand years or so, the hazard is dominated by active strontium, cesium 137. They're both biologically active radionuclides, and I plotted on this the time, the minimum hydrological transportation from the repository to the Amargosa Valley. I took no credit for any engineered safeguards whatsoever. I said, let's assume they all fail and the only thing that impedes us is the geology, which was the recommendation of our committee to do the analysis this way.

I was very pleased to see that in fact the, according to the DOE report, the hydrogeology alone provides sufficient time for retardation, that basically all the strontium 90 and cesium 137 decay, radioactively decay and become innocuous. That's nice, and the time I took was a little over about 1300 years. They did a very careful analysis of the time to go from the, from the unsaturated zone where the waste will repose initially, down through that into the saturated zone and then lateral transport. But it was reassuring

to see that the radioactive strontium and cesium, which decayed, good rule of thumb is 90 percent of the radioactivity disappears every century. So I actually concluded that the amount of decay would be 10 to the 24th over a couple of millennia. And this is certainly enough to reduce the activity to trivial levels. I was very happy to see that.

Since our committee had taken, we took about, we had a dozen of us, all special -- all physicists who had specialized in ancillary field, my radiobiology, and we had several geologists, physicists who had become geologists on the committee. We had Chairman of Nuclear Engineering Department at Berkeley. We had his brother, who is a chemical engineer with DuPont who designed reprocessing plants.

MODERATOR BROWN: We're trying to keep our comments to about five minutes.

MR. WRENN: I'm just about finished.

MODERATOR BROWN: That's fine, okay.

MR. WRENN: That was the major point. The other one is there's some residual activity left over, and this is not nearly as hazardous as the shorter

lives of cesium and strontium, but I was interested to see that this will eventually go into the Death Valley Aquifer, which is a hydrological deadend, and will not

0127

go to the Colorado River. Which was a question of one of the ladies at the Las Vegas meeting. And basically there's no flowing water out of the Death Valley Aquifer, either on the surface or underneath. It all evaporates through plants and through the surface. It's the only way water can leave. And it can't carry radioactivity with it under those conditions.

So, my views might not be very popular with some people here, but I think that the repository looks like it's safe. And I, I want to add that Senator Anderson's remarks he made before the Las Vegas meeting, in which he said let's just take the plutonium out of this stuff, reprocess it and make it back into fuel for reactors and burn it and make it into electricity, now the argument against that is, once you reprocess it, you make it available not only to, for fuel, but for people to steal, and we want to have safeguards against this. Our committee said the best safeguard is having radioactive fuel, so my suggestion

552387

is to build a nuclear power plant, and solve Nevada's electricity problem at the same time, and I'm sure that our senators are sufficiently innovative to do what's required to cause the political and economic hurdles to be lowered to a level where they could be jumped.

MODERATOR BROWN: Okay.

0128

MR. WRENN: Well, that's it in a nutshell.

MODERATOR BROWN: Thanks, and if you have a copy of your statement --

MR. WRENN: I put one in the box back there.

MODERATOR BROWN: Fine.

MR. WRENN: I have a total of five, that leaves me four more. So --

MODERATOR BROWN: That's fine. The one back there will be --

MR. WRENN: If anybody is particularly interested to see what I wrote up, the technical stuff, I've got a few, and I'm happy to hand what I have out.

MODERATOR BROWN: Okay. Great. Thanks very much.

MR. WRENN: Sorry to keep you all. Thanks. Takes a lot of guts to keep a group that's been sitting

around all day for an extra 10 minutes.

MODERATOR BROWN: We'll see if there's anybody else who's brave enough to try another five minutes? Anybody else with comments at this time?

MR. WRENN: I know we have someone brave enough, because she got up at the end of the Las Vegas meeting. The lady --